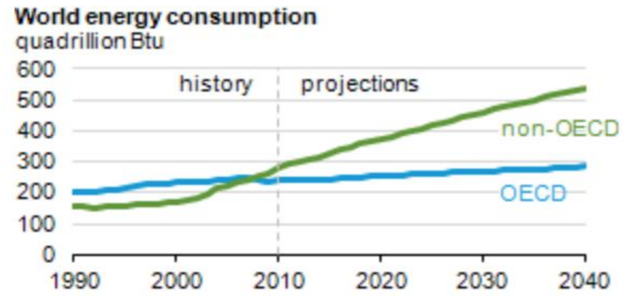
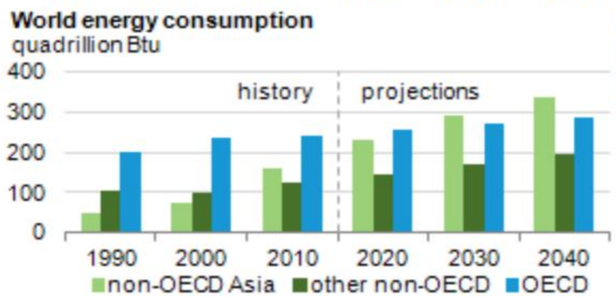
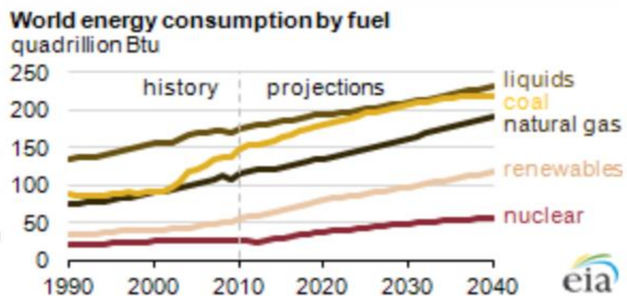
Valuation and financial modelling methodology to support decisions related to energy investments under uncertainty

Background







Energy Investment

- The Global Energy Demand is expected to grow significantly over the next decades.
- New Energy Investment.
- The majority of investments will be in developing countries.

- Large sum of money
- Non-negligible construction periods
- Long useful life
- Uncertainty (financial, technical, regulatory)
- Maintenance cost
- Commodities produced and consumed
- Commodity price
- Future markets

Investment valuation

- Life-cicle cost analysis
- Simple payback
- Discounted payback
- Benefit cost analysis (BCA)
- Net present value (NPV)
- Internal rate of return (IRR)

Aim & Objectives

Aim:

The Aim of the research is to develop a methodology to support decision related to energy investment based on a valuation and financial modelling in a uncertain environment.

Objectives:

1) Identification of qualitative and quantitative investment indicators
2) Development of an assessment methodology for each investment indicators
3) Review of multicriteria assessment methodology;
4) 2 Case studies
5) Study of the application of the developed method to different energy assets.

1) Identification of qualitative and quantitative investment indicators

- Finance
- Contractual framework
- Financial risk
- Environmental impact
- Social Impact
- Technical readiness
- Track records

2) Development of an assessment methodology for each investment indicators

- The financial model will address the uncertainty related to certain variables using the Montecarlo Simulation technique.
- The environmental impact will be evaluated through a Life Cycle Assessment

3) Review of multicriteria assessment methodology

Review of multicriteria methodology and identification of the one which is the most suitable for this project.

4) 2 Case studies

- LNG terminal feasibility (real case study provided by Rina Consulting)
- Offshore Wind Farm

5) Methodology assessment for the application to different energy assets

Assess how the developed methodology can be applied to different energy assets, providing recommendation on which investment indicator should be used depending on the the considered asset, environment, country, etc.

Main References

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REMS RENEWABLE ENERGY MARINE STRUCTURES

EPSRC Engineering and Physical Sciences Research Council

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